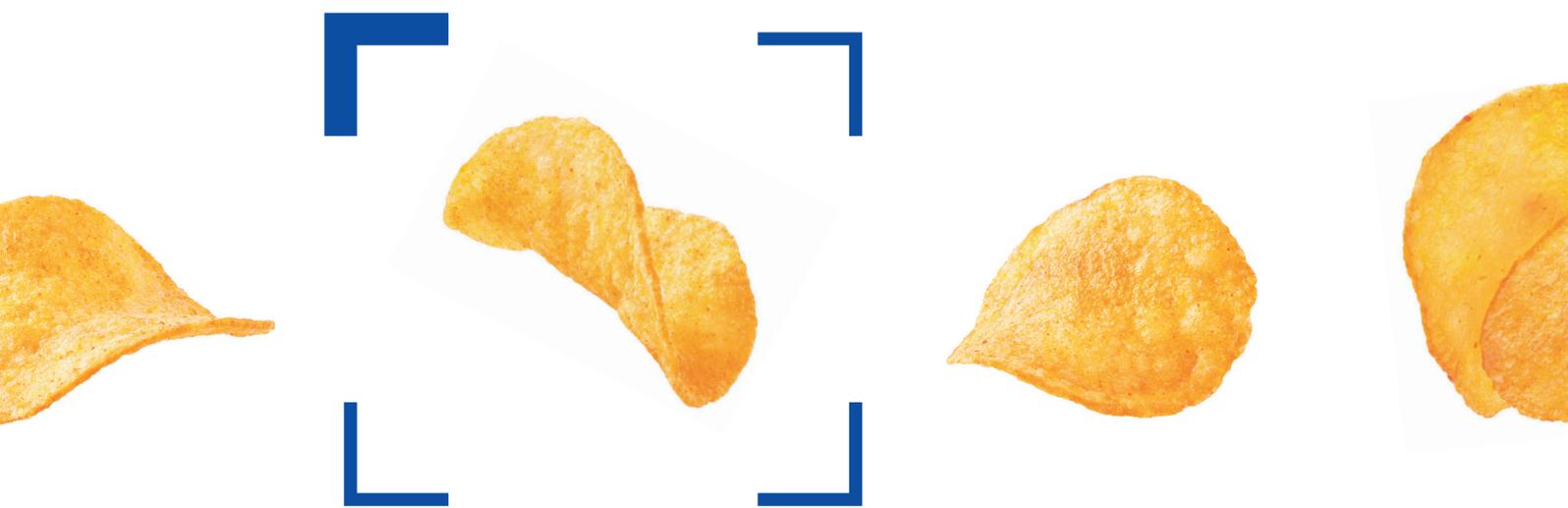


# Maximum quality

## Minimum loss



**The new mark of quality for snack products:  
in-line inspection from ZEISS**

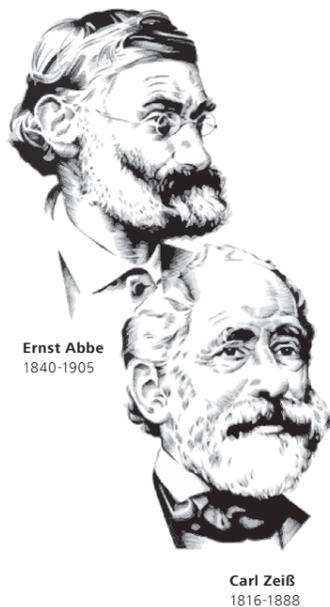


Seeing beyond

# A broad spectrum of quality

## ZEISS – over 140 years of experience in spectroscopy

In Jena in 1874, Ernst Abbe developed the world's first spectrometer for a company that Carl Zeiss founded 28 years earlier. Today, over 140 years after Abbe's spectrometer, ZEISS is one of the world's leading technology companies in the optical and optoelectrical industry with over 30,000 employees in nearly 50 countries and around 120 distribution, service, production and development facilities.

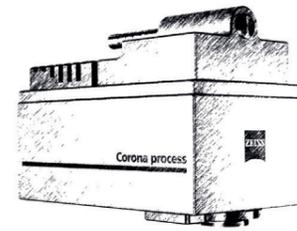


From the beginning, the name ZEISS has stood for continuity and foresight as well as for passion and responsibility. Most importantly of all, the name has stood for globally leading optical measurement technology. Our vision is the perfection of spectroscopy solutions for process and quality control. We've always been the first to bring high-quality technology to the marketplace. Like in 1924, when we developed a photometer that allowed us to measure colors. Or in 1968, when we created the SPECORD series of two-beam spectral photometers for laboratory analyses. Or in 1999, when we set new standards for the agricultural industry with an NIR spectrometer mounted onto a harvester.

Throughout our history, we have always developed new technology that has made processes reproducible and minimized production losses. By fulfilling the quality expectations for products "Made in Germany", we've helped our clients to fulfill their promises to their own customers. This has led to the development of a business area specializing in material analysis, spectroscopy and process analytics, which now plays a key role in the company's global success.

As a reliable partner for consistently high-quality food production (such as snacks, for example), we develop powerful and extremely robust solutions for industrial applications, laboratories and agriculture. We are currently the only ones who can measure snacks just seasoned with salt or the color and Agtron value of snacks.

Our solutions are not only sought after in the food industry and agriculture, but also in space: our high-performance gratings are used in satellites that monitor the air quality on earth, for example. Regardless of whether it's food production, harvesting or space travel, the use of ZEISS equipment provides a technological edge. This is also what drives us every day: maximum efficiency and sustainability as well as long-term success and satisfaction for our customers.



2019

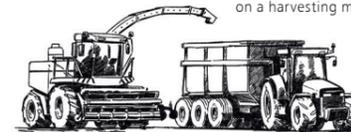
The first connected spectrometer with real time access to data for defined product quality

2013

The first process spectrometer with the highest level of robustness and long-term stability

1999

The first process spectrometer on a harvesting machine



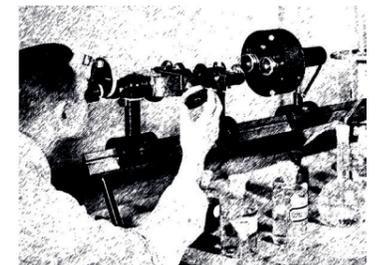
1997

The first NIR spectrometer for the near infrared wavelength



1968

The first SPECORD series two-beam spectral photometer for analyses in the laboratory



1933

The first quartz spectrograph for spectral analyses in the ultraviolet wavelength

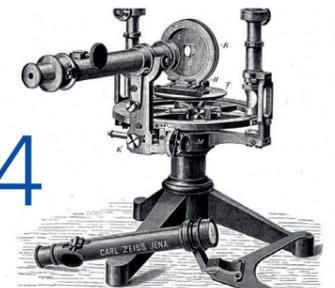


1924

The first photometer for color measurement

1874

The first spectrometer for the spectral fracture of light with a prism system



# The perfect line up

## Your ideal production assistant: the ZEISS Corona<sup>®</sup> process spectrometer

### Less waste with a higher yield:

The full-scale ZEISS Corona<sup>®</sup> process spectrometer can capture a wider wavelength range than other spectrometers, allowing it to measure a variety of parameters at the same time. This provides not just more precise measurements, but also a higher level of reproducibility for products. This allows you to produce consistently good results, even when the quality of your raw materials varies. It doesn't matter if our system is used in the laboratory (at-line) or in an industrial environment (in-line) – it provides reliable measurements in both cases.

This helps you a great deal when it comes to deciding how to optimize production: you can make an important decision in real time and intervene in your process as necessary. Quickly, safely and reliably. ZEISS Corona<sup>®</sup> process plays an integral part in our relationship with our clients: you've made a promise to your own customers and ZEISS is the right partner to help you fulfill it.



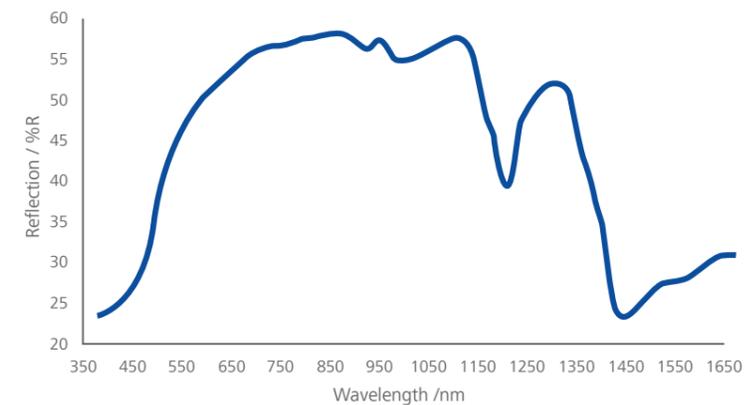
ZEISS Corona<sup>®</sup> process is directly integrated into the production line for in-line measurements. The sensor captures data about constituent elements and the color of snack products on the production line in real time.

### The full-scale ZEISS Corona<sup>®</sup> process spectrometer:

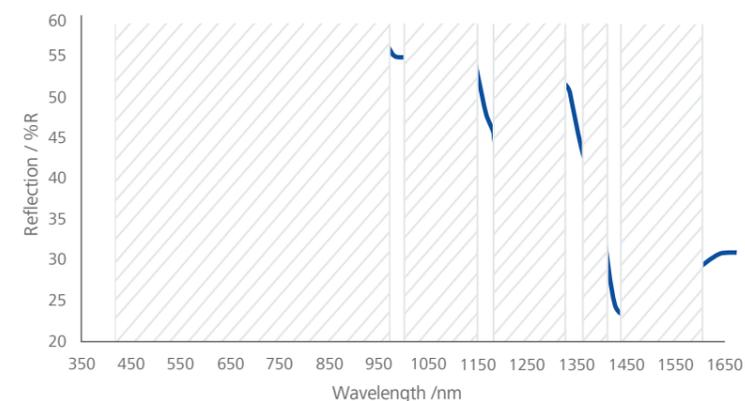
#### one device – an unlimited number of measurement parameters

ZEISS Corona<sup>®</sup> process is able to simultaneously evaluate the vast quantity of information that exists in the 380 to 1,650 nm wavelength range. With other measurement methods, the filters or even the device itself needs to be changed, whereas our spectrometer can measure parameters such as fat, color, salt, dry mass, spices and Agtron value. This guarantees fast and precise inspection of all the important quality parameters at the same time – in real time. That optimizes production costs, reduces production processes and saves energy.

#### Potato chips measured with ZEISS Corona<sup>®</sup> process



#### Potato chips measured with a filter based spectrometer



 **MAKE BETTER DECISIONS, FASTER**

Various quality parameters are measured in real time. This allows you to make important decisions directly when you need to and intervene in your process as necessary.

 **SEAMLESS MEASURABILITY**

You have a continuously available wavelength range of 380 to 1,650 nm at your disposal, where various parameters such as color, fat, moisture and many more are measurable – without having to change the device or filters.

 **THE HIGHEST EFFICIENCY**

The spectrometer minimizes waste and maximizes your production yield. This provides more efficiency and allows you to conserve raw materials, water and energy.

 **SMART FACTORY**

The system is integrated into your production process, takes measurement values directly from your production line and instantly makes them available. This gives you access to data and insights in real time, allowing you to reach the desired product quality even more efficiently.

 **ALL-ROUND USER FRIENDLY**

The sensor supports you in optimizing the operation of your production line. The device is easy to use, documents everything completely, is easily integrated into the production environment and allows for data to be quickly and efficiently allocated to its source.

# From raw material to snack

Complete quality control  
in one device



A product is only ever as good as the stuff from which it is made. Nature's raw materials can of course vary depending on factors that we cannot control, such as exposure to sunlight, increased dryness or heavy rains. ZEISS can't influence that. However, as soon as a raw material is ready for processing, ZEISS Corona® process can ensure that the maximum amount of quality is extracted. Like guaranteeing chips have uniform moisture or that peanut flips have the perfect amount of seasoning. For us, it's clear that a product is more than the sum of its parts. That's why we've developed our full-scale spectrometer to give our clients complete control over their production – across the entire process from start to finish. ZEISS Corona® process makes this possible by measuring various parameters at the same time in real time. So that you have a complete overview of your production the entire time and can make interventions if something doesn't go according to plan.



## Chips

Measuring point	Measuring parameters
After frying	Moisture and fat content, color
Seasoning drum	Salt content

## Extruded Products

Measuring point	Measuring parameters
After the oven	Color, moisture
Seasoning drum	Seasoning, salt content

## Bakery Products

Measuring point	Measuring parameters
After frying	Color (degree of bake), moisture

## Pellets

Measuring point	Measuring parameters
After frying	Moisture
Flavoring	Seasoning, salt content

## Popcorn

Measuring point	Measuring parameters
Seasoning drum	Salt and sugar content

# The hardware

## Robust, fast, safe

### 1. Robustness for extreme environments

Degree of protection: IP 67, ATEX Zone 21/22  
 Operating temperature: -10 – 50 °C  
 Storage temperature: -40 – 70 °C  
 Shockproof up to 25G, vibration resistant (2G, 10 – 500 Hz)

### 2. Simple and fast installation

Flexible fastening systems and easy integration into the process thanks to support for all of the established field bus systems and industrial standards: OPC UA und DA, Profinet, Profibus, EtherNet/IP, analogue and digital I/Os, Modbus, SQL database, socket

### 3. LED status display for operational readiness

Comfortable monitoring of functional activity



### 4. Full-scale spectrometer system made by ZEISS

Coverage of a wide wavelength range from 380 to 1,650 nm for fast in-line measurements and for calculating color and constituent parts

### 5. Reliable results irrespective of distance

A distance sensor ensures comparability of predicted values irrespective of the distance of the sample to the measuring window, distance: 100 – 590 mm

### 6. High reliability from monitoring the lamp function

Two redundant lamps with a lifespan of 10,000 hours each, including automatic switching to the back up lamp in case of failure and a warning for users

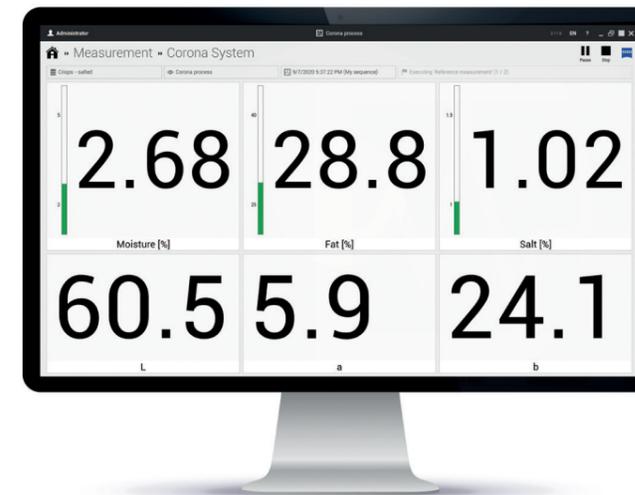
### 7. More safety from automatic assistance systems

Filtering of unwanted spectra and internal white referencing, for example. On top of that: protection of the measuring window from product dust, mist and grease by air purge

# The software

## Intuitive, arranged neatly, user friendly

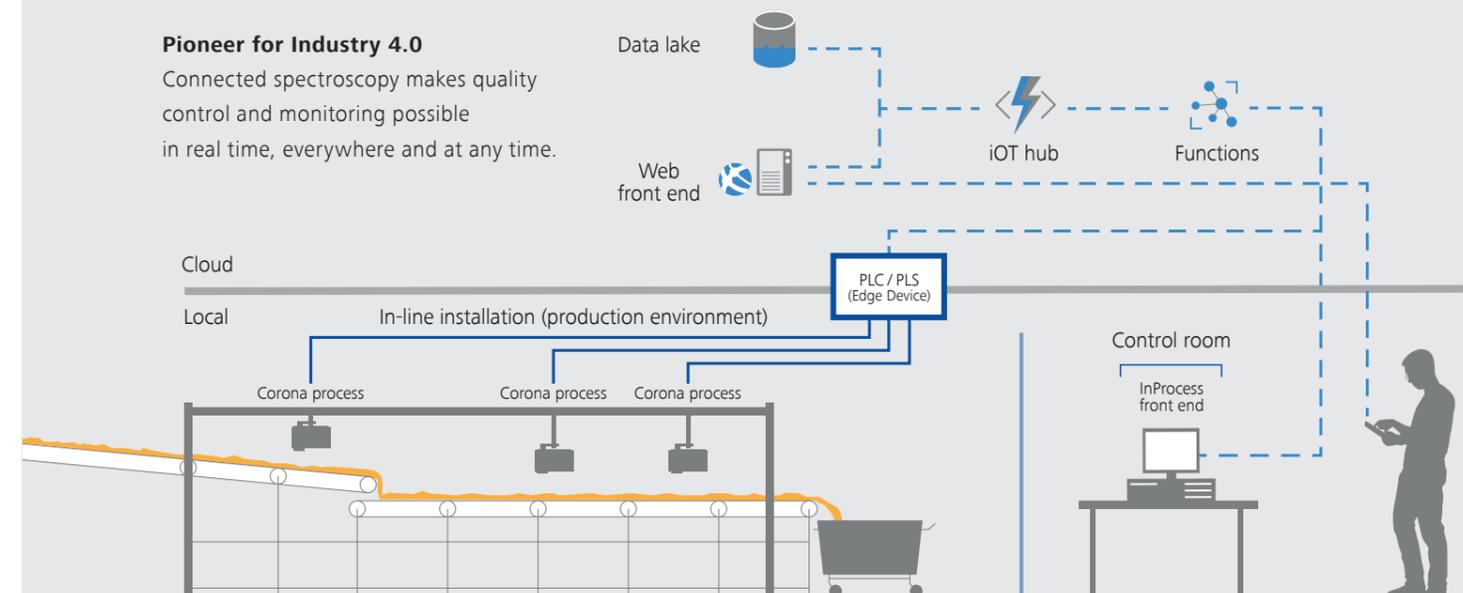
InProcess software enables an easy integration into production lines and intuitive usage. It can be configured according to the client-specific requirements.



- **Calibration:** support for common chemometrics software such as GRAMS, Unscrambler, UCal or SL Predictor
- **Control:** management of more than one spectrometer is possible – with just one piece of software
- **User management:** creation of dedicated user groups with different access levels
- **Measurement:** display as spectrum, value or trend, automatic warning when limit values are exceeded, automatic start of measurement and elimination of implausible spectra
- **Integration:** communication with all established field bus systems and industrial standards
- **History:** access to all past measurement and reference results as well as data export of spectra, measured values and sample information
- **Diagnosis:** monitoring of spectrometer functionality with self-testing, important service information at the push of a button

### Pioneer for Industry 4.0

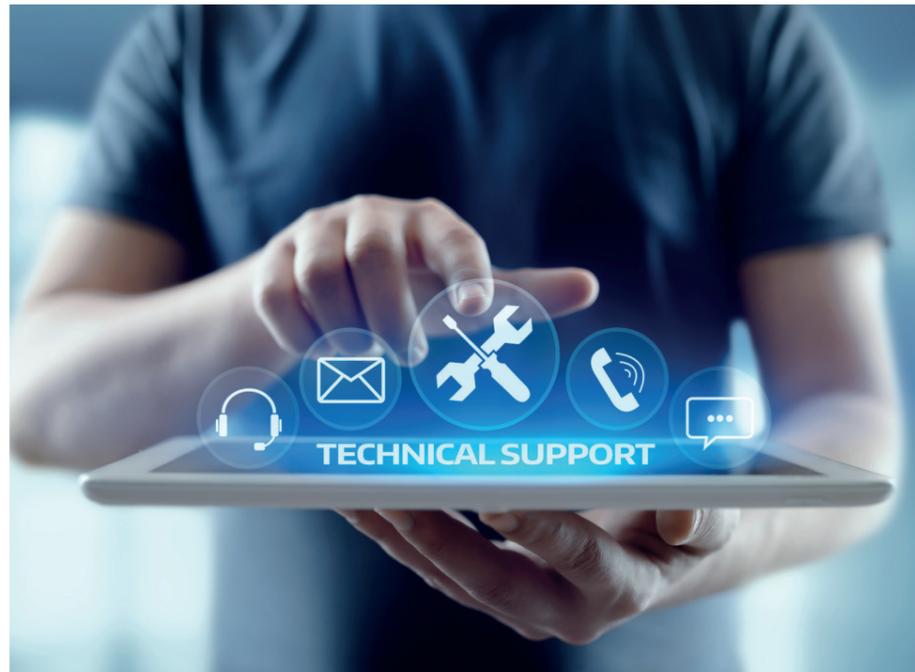
Connected spectroscopy makes quality control and monitoring possible in real time, everywhere and at any time.



# Quality = Service<sup>2</sup>

We're there for you –  
for the lifetime of a device

For us, service means not just being there for you around the clock but being there for you for a device's lifetime. That's why we're by your side from first contact to final purchase and see you primarily as a partner – throughout the entire life cycle of the product.



That's our claim and that's what the ZEISS name stands for. A claim that we fulfill every day. Not just in terms of our technological solutions, but also in terms of our client-specific service conditions. This means that we don't offer you a prefabricated service contract, but rather develop an individual service package with you that's tailored to your project.

You can rely on our global distribution and service network as well. Regardless of whether it's gratings, modules, spectrometers or solutions, hardware, software or calibration, we're the only ones who develop and offer all spectrometer components. Exclusive service packages guarantee optimal performance, increase service life and provide many years of reliable and precise results. The best thing about it: digitalization makes our distance maintenance service particularly user friendly, as there are no waiting times and we are able to provide location-independent solutions quickly. And if something does need to be repaired on site, then our service technicians are already on their way.

## Our expert service at a glance:

- Installation of equipment and software
- Application support for the whole product lifetime
- Preventive maintenance
- Customer-specific maintenance contracts
- On-site and in-house repairs
- Remote diagnostics, maintenance and repair



**We understand our customers and their success.** Nowadays, networked and intelligent spectrometers ensure that companies such as the Australian snack manufacturer Majans Pty Ltd. can determine the salt and moisture content of snack products in seconds. This means that quality problems can be solved almost immediately. The process used to take several minutes to hours using previous methods. ZEISS Corona® process increases the efficiency and yield of your production and ensures that losses are minimized by a maximum.

» The ZEISS Corona process does not only help us to take immediate action on near real time quality exceptions, it also helps us provide targeted training and feedback to our teams. «

Amit Raniga,  
Managing Director Majans Pty Ltd.

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